



## B Nutrient Management Plan



## NUTRIENT MANAGEMENT PLAN IDENTIFICATION

**Operator**  
Norm Risavi  
PO Box 1000  
Montross, VA 22520  
8044930130

**Integrator:** None

**Farm Coordinates**  
Easting: 0, Northing: 0, zone: 17

**Watershed Summary**  
watershed: PL70  
county: Westmoreland

**Nutrient Management Planner**  
Jeff Michel  
PO Box 71  
Warrenton VA. 20186

**Certification Code:** 499

**Acreage Use Summary**  
Total Acreage in this plan: 50.4  
Cropland: 0.  
Hayland: 0.  
Pasture: 0.  
Specialty: 50.4

**Livestock Summary**  
Beef Cattle 0  
Dairy Cattle 0  
Poultry 0  
Swine 0  
Other 0

### Manure Production Balance

|       | Imported | Produced | Exported | Used | Net |
|-------|----------|----------|----------|------|-----|
| kgals | 0.       | 0.       | 0.       | 0.   | 0.  |
| tons  | 0.       | 0.       | 0.       | 0.   | 0.  |

Plan written 11/1/2012  
Valid until 11/1/2015

Signature: \_\_\_\_\_

Planner

11/1/2012  
date

Douglas W. Domenech  
Secretary of Natural Resources



David A. Johnson  
Director

**COMMONWEALTH of VIRGINIA**  
**DEPARTMENT OF CONSERVATION AND RECREATION**

203 Governor Street  
Richmond, Virginia 23219-2010  
(804) 786-1712

11/08/2012

Jeff Michel  
M&M Consulting, Inc.  
P.O. Box 71  
Warrenton, VA 20188

RE: Nutrient management plan revision submission: 10/15/2012

Dear Mr. Michel:

Your revised nutrient management plan for Coles Point Wastewater Treatment Plant, operated by Norm Risavi, located in Westmoreland County in watershed PL70 has been approved by the Virginia Department of Conservation & Recreation. This site consists of a 50.4 acre agricultural field that is divided into 6 sub-fields of approximately 8.4 acres each and will receive the effluent by means of irrigation that is generated at the Coles Point Wastewater Treatment Plant.

This site has been site inspected by DCR in conjunction with representatives from DEQ and Westmoreland County. Any revisions made to this NMP must be approved by DCR. Please note that this letter should be kept with the nutrient management plan and this plan expires on 11/01/2015. Feel free to contact me should you have any questions concerning this letter.

Sincerely,

A handwritten signature in black ink, appearing to read "MR Barnes McAden".

Rachel Barnes McAden  
Environmental Specialist - Biosolids  
Division of Stormwater Management  
(804) 371-2762  
[rachel.mcaden@dcr.virginia.gov](mailto:rachel.mcaden@dcr.virginia.gov)

cc: DEQ -Piedmont Regional Office, Westmoreland County Administrator

*State Parks • Stormwater Management • Outdoor Recreation Planning  
Natural Heritage • Dam Safety and Floodplain Management • Land Conservation*

# **Nutrient Management Plan Balance Sheet** **(Spring, 2012-Fall, 2015)** **Coles Point** **Planner: Jeff Michel (cert. No. 499)**

Tract: Route 612 Eastern Tract      Location: Westmoreland  
(N = N based, 1P = P based, 1.5P = P based at 1.5 removal, 0P = No P allowed)

| Field<br>CFSA No.<br>/Name | Size<br>(ac)<br>Total/<br>Used | Yr.  | Crop            | Needs<br>N-P-K<br>(lbs/ac) | Leg<br>/Man<br>Resid | Manure/Biosid<br>Rate & Type<br>(season) | IT<br>(d) | Man/Bios<br>N-P-K<br>(lbs/ac) | Net = Needs -<br>applied N-P-K<br>(lbs/ac) | Sum<br>P<br>rem<br>cred | Commercial<br>N-P-K<br>(lbs/ac) | Notes |
|----------------------------|--------------------------------|------|-----------------|----------------------------|----------------------|--|-----------|-------------------------------|--|-------------------------|---------------------------------|-------|
| 0/1A(N)                    | 8/8                            | 2012 | Mixed Grass Hay | 60-60-120                  | 0/0                  | 496 K Efflue(Su)                         | >7        | 36-39-141                     | 25-20-(20)                                 | N/A                     |                                 |       |
|                            |                                | 2013 | ...             | 60-60-120                  | 0/2                  | 496 K Efflue(Su)                         | >7        | 36-39-141                     | 20-40-(40)                                 | N/A                     |                                 |       |
|                            |                                | 2014 | ...             | 60-60-120                  | 0/4                  | 496 K Efflue(Su)                         | >7        | 36-39-141                     | 20-60-(60)                                 | N/A                     |                                 |       |
|                            |                                | 2015 | ...             | 60-60-120                  | 0/5                  | 496 K Efflue(Su)                         | >7        | 36-39-141                     | 20-80-(80)                                 | N/A                     |                                 |       |
| 0/1B(N)                    | 8/8                            | 2012 | Mixed Grass Hay | 60-60-120                  | 0/0                  | 496 K Efflue(Su)                         | >7        | 36-39-141                     | 25-20-(20)                                 | N/A                     |                                 |       |
|                            |                                | 2013 | ...             | 60-60-120                  | 0/2                  | 496 K Efflue(Su)                         | >7        | 36-39-141                     | 20-40-(40)                                 | N/A                     |                                 |       |
|                            |                                | 2014 | ...             | 60-60-120                  | 0/4                  | 496 K Efflue(Su)                         | >7        | 36-39-141                     | 20-60-(60)                                 | N/A                     |                                 |       |
|                            |                                | 2015 | ...             | 60-60-120                  | 0/5                  | 496 K Efflue(Su)                         | >7        | 36-39-141                     | 20-80-(80)                                 | N/A                     |                                 |       |
| 0/2A(N)                    | 8/8                            | 2012 | Mixed Grass Hay | 60-60-120                  | 0/0                  | 496 K Efflue(Su)                         | >7        | 36-39-141                     | 25-20-(20)                                 | N/A                     |                                 |       |
|                            |                                | 2013 | ...             | 60-60-120                  | 0/2                  | 496 K Efflue(Su)                         | >7        | 36-39-141                     | 20-40-(40)                                 | N/A                     |                                 |       |
|                            |                                | 2014 | ...             | 60-60-120                  | 0/4                  | 496 K Efflue(Su)                         | >7        | 36-39-141                     | 20-60-(60)                                 | N/A                     |                                 |       |
|                            |                                | 2015 | ...             | 60-60-120                  | 0/5                  | 496 K Efflue(Su)                         | >7        | 36-39-141                     | 20-80-(80)                                 | N/A                     |                                 |       |
| 0/2B(N)                    | 8/8                            | 2012 | Mixed Grass Hay | 60-60-120                  | 0/0                  | 496 K Efflue(Su)                         | >7        | 36-39-141                     | 25-20-(20)                                 | N/A                     |                                 |       |
|                            |                                | 2013 | ...             | 60-60-120                  | 0/2                  | 496 K Efflue(Su)                         | >7        | 36-39-141                     | 20-40-(40)                                 | N/A                     |                                 |       |
|                            |                                | 2014 | ...             | 60-60-120                  | 0/4                  | 496 K Efflue(Su)                         | >7        | 36-39-141                     | 20-60-(60)                                 | N/A                     |                                 |       |
|                            |                                | 2015 | ...             | 60-60-120                  | 0/5                  | 496 K Efflue(Su)                         | >7        | 36-39-141                     | 20-80-(80)                                 | N/A                     |                                 |       |
| 0/3A(N)                    | 8/8                            | 2012 | Mixed Grass Hay | 60-60-120                  | 0/0                  | 496 K Efflue(Su)                         | >7        | 36-39-141                     | 25-20-(20)                                 | N/A                     |                                 |       |
|                            |                                | 2013 | ...             | 60-60-120                  | 0/2                  | 496 K Efflue(Su)                         | >7        | 36-39-141                     | 20-40-(40)                                 | N/A                     |                                 |       |
|                            |                                | 2014 | ...             | 60-60-120                  | 0/4                  | 496 K Efflue(Su)                         | >7        | 36-39-141                     | 20-60-(60)                                 | N/A                     |                                 |       |
|                            |                                | 2015 | ...             | 60-60-120                  | 0/5                  | 496 K Efflue(Su)                         | >7        | 36-39-141                     | 20-80-(80)                                 | N/A                     |                                 |       |
| 0/3B(N)                    | 8/8                            | 2012 | Mixed Grass Hay | 60-60-120                  | 0/0                  | 496 K Efflue(Su)                         | >7        | 36-39-141                     | 25-20-(20)                                 | N/A                     |                                 |       |
|                            |                                | 2013 | ...             | 60-60-120                  | 0/2                  | 496 K Efflue(Su)                         | >7        | 36-39-141                     | 20-40-(40)                                 | N/A                     |                                 |       |
|                            |                                | 2014 | ...             | 60-60-120                  | 0/4                  | 496 K Efflue(Su)                         | >7        | 36-39-141                     | 20-60-(60)                                 | N/A                     |                                 |       |
|                            |                                | 2015 | ...             | 60-60-120                  | 0/5                  | 496 K Efflue(Su)                         | >7        | 36-39-141                     | 20-80-(80)                                 | N/A                     |                                 |       |

Commercial Application Methods:  
br - Broadcast ba - Banded sd - Sidedress  
Notes:

## **Coles Point Narrative**

### **NARRATIVE:**

#### **Description of use:**

This Nutrient Management Plan is an update of a previously approved plan dated June 20 2012 for the Coles Point Wastewater Treatment Plant in Westmoreland County Virginia. The site involved with this plan is an agricultural field located at 38.10357/76.62715 on the southeastern side of State Route 612. This plan was prepared by M&M Consulting Inc. with the assistance of a previous plan prepared by Draper Aden Associates and Resource International Ltd.

The objective of the plan is four-fold.

1. The primary objective of the plan is to insure that the soils located within the wastewater disposal area maintain their ability to absorb water.
2. To maintain a stand of mixed grasses which include Reed Canarygrass, Tall Fescue, Bermudagrass, and Broomsedge that has the ability to absorb and utilize the fertility inherent to the treated effluent water being processed by the wastewater plant.
3. To mow, harvest, or otherwise utilize and maintain this mixed stand of grasses to allow for the efficient use of opportunities to irrigate the wastewater on the site and protect the viability of the grass stand. Currently the amount of nutrients supplied by the wastewater underfertilize the mixed grass stand as suggested in the VT agronomic and turfgrass guidelines. This is acceptable in our situation since our objective is to maintain a stand of grass to absorb the wastewater and it's nutrients not produce a marketable grass export from the site. We will use the organic matter threshold of 7% to determine the need to remove generated tissue. Readings less than 7% will allow us to recycle clippings into the fields. Readings above 7% will allow us to consider removing clippings from the fields.
4. To secure a waiver for the 2" per week irrigation restriction to allow the plant operators to irrigate based on tensiometer readings and visual plant and soil observations.

This NMP deals with the listed objectives in the following manner.

1. The data provided by frequent soil and water testing will be utilized to determine a course of action to maintain the viability of the soil. Input recommendations will not be based solely on pH or crop requirements but the ratios and relationships of metals in the soil and water. Calcium containing products, such as limestone and gypsum, will be important tools in modifying and maintaining cation ratios in the soil.

This cation imbalance plan will utilize testing that is currently in place to maintain a calcium ratio of 60-70%, a magnesium ratio of 10-20%, and Potassium ratio of 2-8%, and a sodium ratio of under 6% with hydrogen making up the balance of the cations.

2. Our fertility inputs to maintain a stand of mixed grasses will primarily come from the water. If the water cannot support a viable stand of grasses based on our mowing, haying, and visual observation and analysis, additional fertility will be applied to improve the stand. Some of the shortfalls of fertility can be made up by mowing and the recycling of clippings into the stand. If commercial fertility is required, the inputs will be based on observation, combined with soil and water testing data. Broadleaf and non selective weed control should be a integral part of the mixed grass stand maintenance program.

According to the data provided by the WWTP, the total input flow for 2011 was 9696640 gallons which equates to a daily flow rate of 26566 gallons. This is significantly below the anticipated daily flow rate of 75000 gallons. For the purpose of the plan we are going to deal with an anticipated flow of 25,000,000 gallons. This will allow for the development of a plan that takes into account planned expansions of the system within the NMP and DEQ permit timelines. A quarterly review of the flow rates and application events will allow for the adjustment of inputs to the fields and the mixed grass stand.

The irrigation areas consist of approximately 50.4 acres that is divided equally into 6 sub-fields of approximately 8.4 acres. The sub-fields are labeled 1-A, 1-B, 2-A, 2-B, 3-A, 3-B.

The existing crop is a mixture of Reed Canarygrass hybrid Palaton, Tall Fescue, Common Bermudagrass, and Broomsedge. All fields have an acceptable level of ground coverage. If a thinning of the stand occurs, either Reed Canarygrass or Mowark Forage Bermudagrass will be interseeded into the stand to improve density. The primary objective is to maintain a stand of grasses that will utilize and absorb the small quantity of nutrients found in the effluent water. New tools have become available recently to measure the moisture content of the soil. Westmoreland County has purchased the portable FieldScout TDR 300 Soil Moisture Meter to sample more data points in the fields than the existing tensiometers and is the current tool used to collect data for the determination of irrigating opportunities. Improvement in irrigation cycles during periods of stress will improve and help maintain the mixed grass stand.

### **Soil Types**

Three soil types occur in the application area; Bertie, State fine sandy loam, and Tetotum loam. All soils listed are classified as Productivity Group I for grass hay. Please note that the area mapped as Bertie soil in the NMP is mapped as Lumbee soil in the Soil Survey of Westmoreland County; however the NRCS determined the area to be a Bertie Soil in a letter dated June 13, 2003 from John Nicholson, Soil Resources Specialist.

I substituted the State soil in the place of the Bertie soil since the Bertie soil is not listing in the Nut-Man program. Both soils are Productivity Group I for grass hay.

## Effluent Water Nutrient Calculations

### 2011 Average CPWWTP Water Sample Results:

|           |            |
|-----------|------------|
| NO3-      | 6.50 ppm   |
| NH4+      | 2.16 ppm   |
| TKN       | 3.31 ppm   |
| Total P   | 4.14 ppm   |
| Potassium | 28.2 ppm   |
| Sodium    | 163.83 ppm |

### Nitrogen

$$\text{NO}_3^- + (\text{NH}_4 \times .5) + (\text{TKN} - \text{NH}_4) = \text{PAN}$$

$$6.5\text{ppm NO}_3^- + (2.16\text{ppm NH}_4 \times .5) + (3.31\text{ppm TKN} - 2.16)$$

$$= 8.73\text{ppm Plant Available Nitrogen}$$

$$8.73\text{ppm PAN} = .000072772 \text{ \# PAN/gallon H}_2\text{O}.$$

$$.000072772 \text{ \# PAN/gal} \times 25000000 \text{ gallons effluent} = 1819.3 \text{ \# PAN}$$

$$1819.3 \text{ \# PAN} / 50.4 \text{ acres} = 36.1 \text{ \# PAN/acre}$$

$$36.1 \text{ \# PAN/acre}$$

### Phosphorus (P2O5)

$$4.14\text{ppm P} = .000034511 \text{ \# P/gallon effluent}$$

$$.000034511 \text{ \# P} \times 25000000 \text{ gallons effluent} = 862.8 \text{ \# P}$$

$$862.8 \text{ \# P} / 50.4 \text{ acres} = 17.2 \text{ \# P/acre}$$

$$17.2 \text{ \# P/acre} \times 2.29 \text{ \# P}_2\text{O}_5/\text{P} = 39.4 \text{ \# P}_2\text{O}_5/\text{acre}$$

$$39.4 \text{ \# P}_2\text{O}_5/\text{acre}$$



### **Potassium (K<sub>2</sub>O)**

28.20 ppm K = .000235072# K/gallon effluent

.000235072# K x 25000000 gallons effluent = 5876.8# K

5876.8# K / 50.4 acres = 116.6# K

116.6# K x 1.2# K<sub>2</sub>O/K = 140.0# K<sub>2</sub>O/acre

**140.0# K<sub>2</sub>O/acre**

### **Sodium (Na)**

163.83 ppm Na = .001365668# Na/gallon effluent

.001365668# Na x 25000000 gallons effluent = 34141.7# Na

34141.7# Na / 50.4 acres = 677.4# Na/acre

**677.4# Na/acre**

## **ACTION PLAN:**

Apply high calcium limestone to fields 1A, 1B, 2A, 2B in the spring of 2013.

The fertility applications to the fields will be applied via the effluent water. The NutMan plan does not have a tab for this contingency, therefore the nutrient application is treated as a commercial broadcast application within this plan.

Interseed any poor grass coverage areas in the fields with either Reed Canarygrass or Mohawk Bermudagrass. Necessity of interseeding will be determined by quarterly site review by CPWWTP employees.

This project began with the assumption that there would be a tremendous amount of nutrients in the wastewater stream and that there would be a significant daily volume of water to dispose of. Both assumptions have been proven to be overstated. The amount of nutrition, especially nitrogen and phosphorus, has been shown to be far lower than expected. The total water volume at the plant is also about 1/3 of what was projected. Therefore it is in the interest of all parties and of the environment to begin shifting toward a mowing management activity as opposed to a hay production activity. Essentially, there are barely enough nutrients to maintain our mixed grass stand and therefore very little nutrients in need of export. By mowing at a height of 4-6" we can help manage broadleaf weeds and undesirable woody vegetation while recycling a small amount of nutrition back into our system. Mowing would also allow for a more effective irrigation schedule to apply water during permitted times and plant needs. If the organic matter in the soil exceeds 7%, we will consider the exportation of the grasses produced on the site.

CPWWTP will retest the soils annually and adjust the calcium and magnesium inputs accordingly.

## Water Balance Sheet

2011 Inflow = 9696640 gallons. It is the objective of the wastewater management to apply all of the effluent produced in a given year during the time of permitted application. This is the latest volume for 2011 treated and stored by the plant.

$9696640 \text{ gallons} / 27145 \text{ gallons per acre inch} = 357.22 \text{ acre inches.}$

$357.22 \text{ acre inches} / 50.4 \text{ acres} = 7.09 \text{ inches per acre.}$

$7.09 \text{ inches per acre} \times 27145 \text{ gallons per acre inch} = 192458 \text{ gallons per acre.}$

$192458 \text{ gallons} \times .000090694 \text{ \#N per gallon} = 17.45 \text{ \#N/acre.}$

Proposed inflow = 25000000.

$25000000 \text{ gallons} / 27145 \text{ gallons per acre inch} = 921 \text{ acre inches}$

$921 \text{ acre inches} / 50.4 \text{ acres} = 18.3 \text{ inches per acre.}$

$18.3 \text{ inches per acre} \times 27145 \text{ gallons per acre inch} = 496754 \text{ gallons per acre.}$

## Soil Test Summary

[illegible]

Manure Production Summary

Manure Name: NewManure2

Animal Summary

Manure Storage Capacity: 0. tons

Manure Analysis:

TKN: 3.31  
P2O5: 4.14  
NH4: 2.16  
K2O: 28.2

Plant Available Nutrients:

Immediate Incorporation:

1.94 lbs N  
4.14 lbs P2O5  
28.20 lbs K2O

Surface Applied:

1.08 lbs N  
4.14 lbs P2O5  
28.20 lbs K2O

Residual N:

yr 1: .14 lbs  
yr 2: .06 lbs  
yr 3: .02 lbs

Manure Production

Dec-Feb 0  
Mar-May 0  
Jun-Aug 0  
Sep-Nov 0

Total Produced: 0  
Manure Sold/yr: 0  
Manure purch./yr: 0

**Biosolid Name: Effluent**

Availability: unlimited

Biosolid Type: Aerobic Digestion

% solid: 24.0

pH: 6.2

%CCE: 0.0

**Biosolid Analysis (ppm):**

TKN: 32

NH4-N: 12

NO3: 24

P2O5: 38.93

K2O: 141.6

**Plant Available Nutrients:**

Immediate Incorporation:

0.08 lbs N

0.08 lbs P2O5

0.28 lbs K2O

Surface Applied:

0.07 lbs N

0.08 lbs P2O5

0.28 lbs K2O

Residual N:

yr1: 0.0 lbs N

yr2: 0.0 lbs N

yr3: 0.0 lbs N

### Field Productivities for Major Crops

| Tract Name | Tract/<br>Field | Field Name | Acres | Predominant<br>Series | Soil | Corn | Small<br>Grain | Alfalfa    | Grass<br>Hay | Environmental Warnings |
|------------|-----------------|------------|-------|-----------------------|------|------|----------------|------------|--------------|------------------------|
| Route 612  | 0/0             | 1A*        | 8     | Lumbee                |      | V    | V              | Not Suited | Not Suited   | Poor Drainage          |
| Ea         | 0/0             | 1B*        | 8     | Lumbee                |      | V    | V              | Not Suited | Not Suited   | Poor Drainage          |
|            | 0/0             | 2A*        | 8     | Lumbee                |      | V    | V              | Not Suited | Not Suited   | Poor Drainage          |
|            | 0/0             | 2B         | 8     | Tetotum               |      | IIla | I              | III        | I            |                        |
|            | 0/0             | 3A         | 8     | Tetotum               |      | IIb  | I              | III        | I            |                        |
|            | 0/0             | 3B         | 8     | Tetotum               |      | IIb  | I              | II         | I            |                        |

\* Do not apply manure or biosolids more than 30 days prior to planting. Apply commercial fertilizer nitrogen to row crops in split spring applications.

### Yield Range

| Field<br>Productivity<br>Group | Corn Grain<br>Bu/Acre | Barley/Intensive<br>Wheat Bu/Acre | Sid. Wheat<br>Bu/Acre | Alfalfa<br>Tons/Acre | Grass/Hay<br>Tons/Acre |
|--------------------------------|-----------------------|-----------------------------------|-----------------------|----------------------|------------------------|
| I                              | >170                  | >80                               | >64                   | >6                   | >4.0                   |
| II                             | 150-170               | 70-80                             | 56-64                 | 4-6                  | 3.5-4.0                |
| III                            | 130-150               | 60-70                             | 48-56                 | <4                   | 3.0-3.5                |
| IV                             | 100-130               | 50-60                             | 40-48                 | NA                   | <3.0                   |
| V                              | <100                  | <50                               | <40                   | NA                   | NA                     |

## Manure Spreading Summary

| Season | Manure   | Rate/ac     | Tract     | Field | Acres | Crop            | Total in Field | Running Total |
|--------|----------|-------------|-----------|-------|-------|-----------------|----------------|---------------|
| 2012Su | Effluent | 496.0 kgals | Route 612 | 1A    | 8     | Mixed Grass Hay | 4166 kgals     | 4166 kgals    |
|        |          | 496.0 kgals | Route 612 | 1B    | 8     | Mixed Grass Hay | 4166 kgals     | 8333 kgals    |
|        |          | 496.0 kgals | Route 612 | 2A    | 8     | Mixed Grass Hay | 4166 kgals     | 12499 kgals   |
|        |          | 496.0 kgals | Route 612 | 2B    | 8     | Mixed Grass Hay | 4166 kgals     | 16666 kgals   |
|        |          | 496.0 kgals | Route 612 | 3A    | 8     | Mixed Grass Hay | 4166 kgals     | 20832 kgals   |
|        |          | 496.0 kgals | Route 612 | 3B    | 8     | Mixed Grass Hay | 4166 kgals     | 24998 kgals   |

| Season | Manure   | Rate/ac     | Tract     | Field | Acres | Crop            | Total in Field | Running Total |
|--------|----------|-------------|-----------|-------|-------|-----------------|----------------|---------------|
| 2013Su | Effluent | 496.0 kgals | Route 612 | 1A    | 8     | Mixed Grass Hay | 4166 kgals     | 4166 kgals    |
|        |          | 496.0 kgals | Route 612 | 1B    | 8     | Mixed Grass Hay | 4166 kgals     | 8333 kgals    |
|        |          | 496.0 kgals | Route 612 | 2A    | 8     | Mixed Grass Hay | 4166 kgals     | 12499 kgals   |
|        |          | 496.0 kgals | Route 612 | 2B    | 8     | Mixed Grass Hay | 4166 kgals     | 16666 kgals   |
|        |          | 496.0 kgals | Route 612 | 3A    | 8     | Mixed Grass Hay | 4166 kgals     | 20832 kgals   |
|        |          | 496.0 kgals | Route 612 | 3B    | 8     | Mixed Grass Hay | 4166 kgals     | 24998 kgals   |

| Season | Manure   | Rate/ac     | Tract     | Field | Acres | Crop            | Total in Field | Running Total |
|--------|----------|-------------|-----------|-------|-------|-----------------|----------------|---------------|
| 2014Su | Effluent | 496.0 kgals | Route 612 | 1A    | 8     | Mixed Grass Hay | 4166 kgals     | 4166 kgals    |
|        |          | 496.0 kgals | Route 612 | 1B    | 8     | Mixed Grass Hay | 4166 kgals     | 8333 kgals    |
|        |          | 496.0 kgals | Route 612 | 2A    | 8     | Mixed Grass Hay | 4166 kgals     | 12499 kgals   |
|        |          | 496.0 kgals | Route 612 | 2B    | 8     | Mixed Grass Hay | 4166 kgals     | 16666 kgals   |
|        |          | 496.0 kgals | Route 612 | 3A    | 8     | Mixed Grass Hay | 4166 kgals     | 20832 kgals   |
|        |          | 496.0 kgals | Route 612 | 3B    | 8     | Mixed Grass Hay | 4166 kgals     | 24998 kgals   |

| Season | Manure   | Rate/ac     | Tract     | Field | Acres | Crop            | Total in Field | Running Total |
|--------|----------|-------------|-----------|-------|-------|-----------------|----------------|---------------|
| 2015Su | Effluent | 496.0 kgals | Route 612 | 1A    | 8     | Mixed Grass Hay | 4166 kgals     | 4166 kgals    |
|        |          | 496.0 kgals | Route 612 | 1B    | 8     | Mixed Grass Hay | 4166 kgals     | 8333 kgals    |
|        |          | 496.0 kgals | Route 612 | 2A    | 8     | Mixed Grass Hay | 4166 kgals     | 12499 kgals   |
|        |          | 496.0 kgals | Route 612 | 2B    | 8     | Mixed Grass Hay | 4166 kgals     | 16666 kgals   |
|        |          | 496.0 kgals | Route 612 | 3A    | 8     | Mixed Grass Hay | 4166 kgals     | 20832 kgals   |
|        |          | 496.0 kgals | Route 612 | 3B    | 8     | Mixed Grass Hay | 4166 kgals     | 24998 kgals   |



# Application Summary Report

## 2012: Mixed Grass Hay

| Tract          | Field | Acres | Manure<br>Rate and Type<br>(Season) | Broadcast<br>Commercial | Banded<br>Commercial | Topdress<br>Commercial | Lime<br>(tons) |
|----------------|-------|-------|-------------------------------------|-------------------------|----------------------|------------------------|----------------|
| Route 612 East | 1A    | 8.4   | 496.0k Efflu(Su)                    |                         |                      |                        |                |
|                | 1B    | 8.4   | 496.0k Efflu(Su)                    |                         |                      |                        |                |
|                | 2A    | 8.4   | 496.0k Efflu(Su)                    |                         |                      |                        |                |
|                | 2B    | 8.4   | 496.0k Efflu(Su)                    |                         |                      |                        |                |
|                | 3A    | 8.4   | 496.0k Efflu(Su)                    |                         |                      |                        |                |
|                | 3B    | 8.4   | 496.0k Efflu(Su)                    |                         |                      |                        |                |

## 2013: Mixed Grass Hay

| Tract          | Field | Acres | Manure<br>Rate and Type<br>(Season) | Broadcast<br>Commercial | Banded<br>Commercial | Topdress<br>Commercial | Lime<br>(tons) |
|----------------|-------|-------|-------------------------------------|-------------------------|----------------------|------------------------|----------------|
| Route 612 East | 1A    | 8.4   | 496.0k Efflu(Su)                    |                         |                      |                        | 1.0 (Sp)       |
|                | 1B    | 8.4   | 496.0k Efflu(Su)                    |                         |                      |                        | 1.0 (Sp)       |
|                | 2A    | 8.4   | 496.0k Efflu(Su)                    |                         |                      |                        | 1.0 (Sp)       |
|                | 2B    | 8.4   | 496.0k Efflu(Su)                    |                         |                      |                        | 1.0 (Sp)       |
|                | 3A    | 8.4   | 496.0k Efflu(Su)                    |                         |                      |                        |                |
|                | 3B    | 8.4   | 496.0k Efflu(Su)                    |                         |                      |                        |                |

## 2014: Mixed Grass Hay

| Tract          | Field | Acres | Manure<br>Rate and Type<br>(Season) | Broadcast<br>Commercial | Banded<br>Commercial | Topdress<br>Commercial | Lime<br>(tons) |
|----------------|-------|-------|-------------------------------------|-------------------------|----------------------|------------------------|----------------|
| Route 612 East | 1A    | 8.4   | 496.0k Efflu(Su)                    |                         |                      |                        |                |
|                | 1B    | 8.4   | 496.0k Efflu(Su)                    |                         |                      |                        |                |
|                | 2A    | 8.4   | 496.0k Efflu(Su)                    |                         |                      |                        |                |
|                | 2B    | 8.4   | 496.0k Efflu(Su)                    |                         |                      |                        |                |
|                | 3A    | 8.4   | 496.0k Efflu(Su)                    |                         |                      |                        |                |
|                | 3B    | 8.4   | 496.0k Efflu(Su)                    |                         |                      |                        |                |

## 2015: Mixed Grass Hay

| Tract          | Field | Acres | Manure<br>Rate and Type<br>(Season) | Broadcast<br>Commercial | Banded<br>Commercial | Topdress<br>Commercial | Lime<br>(tons) |
|----------------|-------|-------|-------------------------------------|-------------------------|----------------------|------------------------|----------------|
| Route 612 East | 1A    | 8.4   | 496.0k Efflu(Su)                    |                         |                      |                        |                |
|                | 1B    | 8.4   | 496.0k Efflu(Su)                    |                         |                      |                        |                |
|                | 2A    | 8.4   | 496.0k Efflu(Su)                    |                         |                      |                        |                |
|                | 2B    | 8.4   | 496.0k Efflu(Su)                    |                         |                      |                        |                |
|                | 3A    | 8.4   | 496.0k Efflu(Su)                    |                         |                      |                        |                |
|                | 3B    | 8.4   | 496.0k Efflu(Su)                    |                         |                      |                        |                |

**Route 612 Eastern Tract: 1A**

**Phosphorus Environmental Threshold Calculation**

Last soil test P ppm = 16.08592  
Region = Eastern Shore and Lower Coastal Plain  
PET result = N-based

**Route 612 Eastern Tract: 1B**

**Phosphorus Environmental Threshold Calculation**

Last soil test P ppm = 6.00992  
Region = Eastern Shore and Lower Coastal Plain  
PET result = N-based

**Route 612 Eastern Tract: 2A**

**Phosphorus Environmental Threshold Calculation**

Last soil test P ppm = 15.68288  
Region = Eastern Shore and Lower Coastal Plain  
PET result = N-based

**Route 612 Eastern Tract: 2B**

**Phosphorus Environmental Threshold Calculation**

Last soil test P ppm = 17.09352  
Region = Eastern Shore and Lower Coastal Plain  
PET result = N-based

**Route 612 Eastern Tract: 3A**

**Phosphorus Environmental Threshold Calculation**

Last soil test P ppm = 13.3654  
Region = Eastern Shore and Lower Coastal Plain  
PET result = N-based

**Route 612 Eastern Tract: 3B**

**Phosphorus Environmental Threshold Calculation**

Last soil test P ppm = 14.77604  
Region = Eastern Shore and Lower Coastal Plain  
PET result = N-based